7. Jousting

Program Name: Joust.java   Input File: joust.dat

You are organizing a jousting tournament for the knights in your kingdom.

The tournament is a single elimination tournament, so it consists of a number of rounds. There are N knights who have signed up for the tournament. In this tournament, only the top 3 knights get the prize money.
Say there are R knights left in each round. The R knights line up against the wall of the stadium. The knights are paired off into R/2 pairs, with the first two on the left facing each other, then the next two facing each other, etc. The pairs then joust, and the winners return to their same spots on the wall, and the losers exit the stadium. Approximately half of the remaining knights are defeated each round, up until the round with 4 knights, or the semifinals.
The two knights that win in the semifinals will advance to the finals. The winner of the finals gets first place, and the loser of the finals gets second place. Since there are only 3 prizes, the two knights that lost in the semifinals must play an extra match, with the winner claiming third place.
You want to predict how the tournament is going to play out. To do this, you simulate the various rounds. In this simulation each knight k is assigned a jousting skill level S(k). In the simulation, the knight with the higher skill level always wins the match (there will be no ties in skill level). Using this simulation predict the knights that will get to the top 3 places.

Input
The first line of input contains T, the number of test cases that follow.

The first line of each test case is the number of knights N.
The next N lines each define knights 1 through N. They have a string, which is their name, and an integer, which is their skill level, separated by a space.

Output
For each test case, output the test case number, followed by the top 3 places in the format below.

Constraints
```
1 <= T <= 8
4 <= N <= 32
N is a power of 2.
```

Example Input File
```
2
4
Lancelot 10
Galahad 8
Percival 9
Bors 5
4
Caradoc 50
Gawain 55
Lucan 72
Balin 64
```

Example Output to Screen
```
Case 1:
1: Lancelot
2: Percival
3: Galahad
Case 2:
1: Lucan
2: Gawain
3: Balin
```

Explanation of Output

In the first case, Lancelot faces Galahad, and Percival faces Bors in the round of 4. Lancelot defeats Galahad, and moves on to the finals. Percival defeats Bors and also moves on to the finals. Lancelot wins the finals, putting him in first and Percival in second. The two knights that lost in the round of 4 are Galahad and Bors, and Galahad trumps Bors in the third place match.

In the second case, Caradoc faces Gawain in the first round, and Lucan faces Balin. Gawain bests Caradoc and Lucan bests Balin. In the finals, Lucan defeats Gawain, and Balin defeats Caradoc in the third place match.